ANTERIOR CHAMBER LENSES AND OCULAR MORBIDITY

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FOR
MASTER OF SURGERY
(OPHTHALMOLOGY)

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CERTIFICATE

Certified, that the thesis entitled "**ANTERIOR CHAMBER LENSES AND OCULAR MORBIDITY**" is an original work of **Dr. UMESH KUMAR AHERWAR.** and the observation presented by him is of his own work.

It is further certified, that he has fulfilled the required one year stay at Ophthamology Deptt. M.L.B. Medical College, Jhansi after the registration of thesis.

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UMESH KUMAR AHERWAR

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INTRODUCTION

INTRODUCTION

After the extraction of lens in cataract surgery aphakia develops which is usually corrected by aphakic glasses/spectacles, which have many disadvantages like 25 to 30 % magnification of objects, the viewed objects seen closer and spherical aberration. The patient's field of vision is limited which is compounded with a ring scotoma and these aphakic spectacles are very heavy also.

The advent of contact lenses have solved many of the optical problems of aphakic spectacles such as a full field of vision and distortion are minimized with only about 8 % magnification. Practical rather than optical consideration are the main reasons that the contact lenses are not more widely used by very young and very old patients, find the handling and wearing of these lenses very difficult or impossible especially people who work in very dry or dusty weather.

Intraocular lenses are almost free from all the problems of spectacles and contact lenses. They give a full field of vision and optical aberrations, are small. Thus the intraocular lenses have definite advantages over other methods of aphakic correction. Even with so many advantages the intraocular lenses are not used to correct all aphakic eyes. The answer is that they also have certain disadvantages such as damage to corneal endothelium, uveitis, hyphema and dislocation of intraocular lenses.

There are many types of IOL implants like anterior chamber IOL, Iris supported IOL implants and posterior chamber IOL implants. The later two types have been reported to show high incidence of ocular morbidity. Placing of anterior chamber IOL is an easier procedure without using any sophisticated equipment and instruments and it can be done in small hospitals. Looking at the greater advantages to of anterior chamber intraocular lens implants, we have been encouraged to take a study of ocular morbidity in the use of anterior chamber lenses.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

HISTORY OF IOL

Tadini[1], an intinerate ophthalmologist of the 18th century was probably the first person to mention the possibility of lens implantation into the eye in place of the diseased lens.

Later in 1795 Casamata[1] implanted an artificial lens of glass after cataract extraction, As the glass fell onto the bottom of the eye he realized that glass lenses couldn't be a substitute for the natural lens.

GENERATION I Harold Ridley[12] of London observed that the fragments of Plexiglass (PMMA, perspex) from shattered cockpit canopies could be well tolerated within the eyes of British Pilots following ocular perforation. He carried out first IOL implant operation into the capsular bag on November 29, 1949 after extracapsular cataract extraction. He performed his second implant on 23rd Aug, 1950 Ridley implanted about one thousand IOLs. These cases remained successful as late as 1966. By 1970 however, Ridley reported that at least in 15 % of cases removal of his implants was necessary due to many complications Ridley gave up IOL implantation in 1959.

Ridley summarized the complications of his IOLs as follows:

1. Iritis due to residual lens material in the eye or inadequate removal of implant sterilizing solution.

2. Occlusion of the pupil by a dense inflammatory membrane.

3. Late thickening and opacification of posterior capsule especially in young patients.

4. Loss of anterior chamber.

5. Secondary glaucoma

6. Iris atrophy from pressure by the optic of IOL.

7. IOL dislocation.

GENERATION II : Development of Anterior chamber lenses complications with the original Ridley posterior chamber IOL led to the idea of placing the IOLs in anterior chamber. The main advantages of them were:

1. Implantation could be done after intra or extracapsular cataract extraction.
2. Secondary implantation could be performed.
3. There were less chances of dislocation of lens.

Baron (1952)[12] performed the first anterior chamber lens implantation. This IOL was like a curved disc with a bent forward towards the cornea and it came into contact with the corneal endothelium leading to corneal decompensation.

In 1952 Danheim[12] designed the first flexible closed loop type of anterior chamber lens. This lens failed because of the nylon haptics (supramid-6) which undergoes hydrolytic biodegradation in the eye. This biodegradation led to irritation in the eye, breakdown of loops and disintegration of the IOL with dislocation.

Strampelli on 28th September 1953[79] implanted a tripod anterior chamber lens which was the prototype of rigid anterior chamber IOLs.

Barraquer (1959)[12] modified the Danheim lens and his own closed loop anterior chamber lens in J-loop IOL for the first time after cutting away the one-half of each of the closed loops. These lenses gave good results but the nylon loop biodegradation and occasional deep erosion into the angle recess were the main complications. The J-loop & its various modification have been incorporated with great success into modern posterior chamber lenses.

In 1956 first choyce rigid anterior chamber lens was introduced and later its modifications culminated in the production of mark VIII and mark IX IOLs. UGH syndrome of Ellingson[26,27,38&39] were initially attributed due to warped footplates and poor edge finish of some poorly made copies of these lenses.

GENERATION III Continued development of anterior chamber lenses and introduction of iris supported lenses. In 1953 Epstein introduced iris supported lenses of collarstud type with iris fixation.

Binkhorst in 1957 [15-18] developed the original iris-clip lens which was implanted for the first time on 11 August 1958. Binkhorst designed these lenses with the following points in mind.

1. PMMA is well tolerated in the eye provided it has been properly cleansed and sterilised.

2. Most of the anterior chamber lenses at that time had a high percentage of corneal complications.
3. Posterior chamber lenses upto that time had a strong tendency to dislocate.

In 1965 Binkhorst modified his original lens into 2-loop iridocapsular lens[18].

Later metal loops were introduced in Epstein Matlese cross lens which evolved into the Copeland lens[35].

Fyodorov in 1968 introduced sputnik iris-clip lens[18,19,47&50].

In 1972 Worst Medallion iridocapsular and in 1973 Worst platina lens[20&80] were introduced.

Many of these iris supported lenses were very successful initially but in long term, following complications were encountered[25,34,51,54b,55&65].

1. Atrophy & erosion of ocular tissues.
2. Corneal decompensation, oedema and pseudophakic bullous keratopathy.
3. Cystoid macular oedema.
4. Inflammation and the UGH Syndrome.
5. Cellular proliferative reaction leading to posterior capsular membrane, pupillary membrane and secondary glaucoma, cocoon membrane, excessive fibrosis and synechiae - especially in young patients, vitreous face opacities.
6. Subluxation and dislocation.

7. Complications related to biomaterials eg. nylon and metal loops.

GENERATION IV Major improvement in microsurgical techniques, lens materials and lens design : Introduction of posterior chamber lenses. From 1975 to the present there has been the increasing use of ECCE and posterior chamber implantation. Numerous modern, well designed anterior and posterior chamber IOLs have been introduced which are listed in Table I. Now the implantation techniques are far more refined and are safer. This era has also seen the transition from nylon to polypropylene and PMMA as a loop material.

The most important breakthrough was a return to Ridley's original idea of posterior chamber IOL.

The first of the modern generation posterior chamber lenses was Pearce rigid tripod lens introduced in England in 1975[66].

In 1977[28&63] Shearing introduced J-loop IOL and placed it into the posterior chamber by anchoring it at the ciliary sulcus or within the lens capsular bag. The use of various lens insertion glides and viscoelastic surgical adjuncts have made in the bag implantation an easier procedure. Since 1977 this lens has undergone moderate modifications such as added flexibility and better fixation and centration. By angling the loop posterior from the plane of optic, the optic is placed further from iris and cornea.

Table 1

Evolution of Intraocular lenses

Generation I (1949-54) original Ridley posterior chamber
1. Ridley 1949
2. Parry (Implantation modification, (1954)

Generation II (CA 1952-62) Development of Anterior chamber lenses
1. Rigid or Semirigid
   Baron 1952, 1954
   Scharf, 1953
   Strampelli tripod, 1953
   Schreck, 1954
   Beitti, 1955
   Choyce Mark I 1956
   Ridley Mark I and II 1957, 1960
   Boberg - Ans 1961

2. Flexible or Semiflexible loops

   a. Closed loops
      Dannheim 1952
      Strampelli 1956
      Leib and Guerry 1957

   b. Open loops
      Barraquer, J-loop 1959

Generation III (Ca 1953-70) Continued development of anterior chamber lenses and introduction of iris-supported lenses

Anterior chamber

1. Rigid or Semirigid
   Choyce Mark II 1957 to Choyce Mark VIII, 1963

2. Flexible
   iris supported
   Epstein" Collar stud lenses, 1952
   Binkhorst iris clip 1957, 1958
   Epstein Maltese cross (Evolved into copeland Binkhorst lens) 1962
   Fyodorov type I iris clip 1964
   Binkhorst iridocapsular 1965
   Fyodorov V-type II sputunik iris clip 1968
   Worst Medallion iridocapsular, early 1970s
   Worst Platina early 1970s

Generation IV (Ca 1975 to present) - Major improvement in microsurgical techniques, lens design and lens materials, introduction of posterior chamber lens.

Anterior chamber lenses

1. Rigid or semirigid
   Azar Mark II 1977
   Tennant Anchor 1974

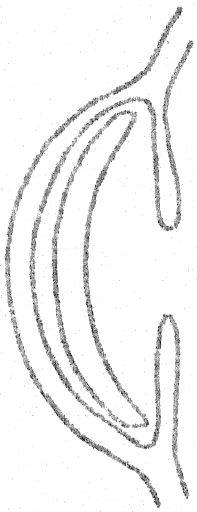
2. Flexible or semiflexible loops or foot plates.
   a. Closed loops
      Leiske 1978
      Hessburg 1981
      Optiflex 1981
      Azar 91Z 1982
      Stable flex 1983
   b. Open loops or footplates
      Kelman II 3-point fixation 1978
      Kelman Quadriflex 1981
      Kelman Omnifity 1981
      Kelman Multiflex 1982
   c. Radial loops
      Copeland 1982

Posterior chamber lenses

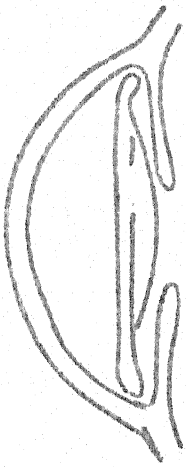
Pearce rigid tripod 1975
Shearing J-loop mid to late 1970s early 1980s
Simcoe C-loop, mid to late 1970s early 1980s
Sinsky, modified J-loop mid to late 1970s early 1980s
Kratz modified J-loop mid to late 1970s early 1980s
Clayman modified J-loop mid to late 1970s early 1980s
Harris, 1 open, I closed loop, closed eg. Sheets
Galand, Knolle
Osher-Fenzl modified J-loop with loopholes at tips of superior loop
Rigid lenses for YAG laser capsulotomy e.g. Hoffer ridge
IOLs with UVR absorber in optics
- IOLs with biconvex or aspherical optics
- Lynell glass optic
- Mozzocco silicone (elestic) IOL
- Universal type (designed to be placed either anterior or posterior chamber (early 1980s)
- Shepard Universal (radial loops)
- Feaster, Dualens
- Pannu type III

Generation V Improvement in material and design of anterior and posterior chamber lenses and introduction of visco-elastic substance in ophthalmic surgery.

ANTERIOR CHAMBER ANGLES FIXATED
LENSES IN PAST



BARON



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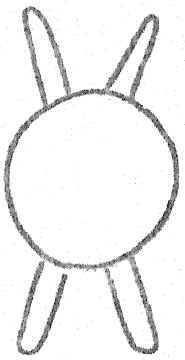
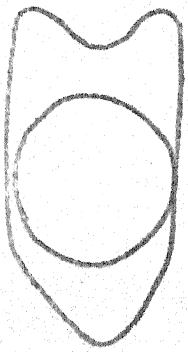


SCHARF



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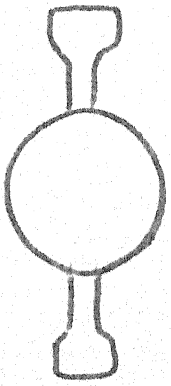

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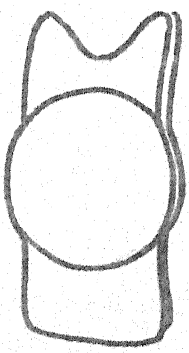

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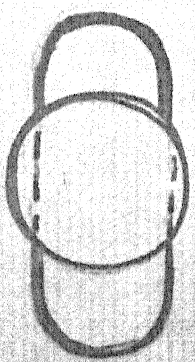
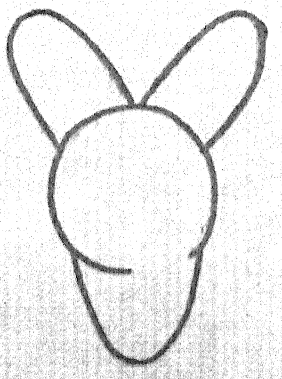
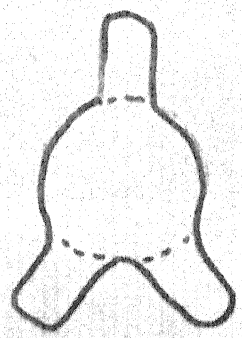


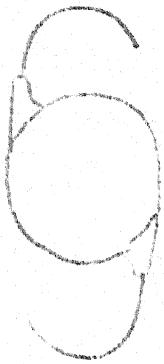
DANNHEIM



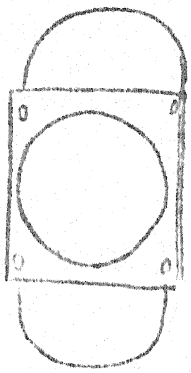
LIEB & GUERRY



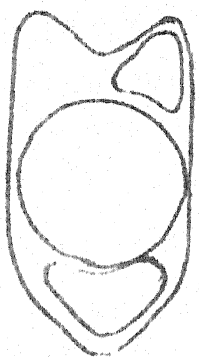
RIDLEY MARK.I



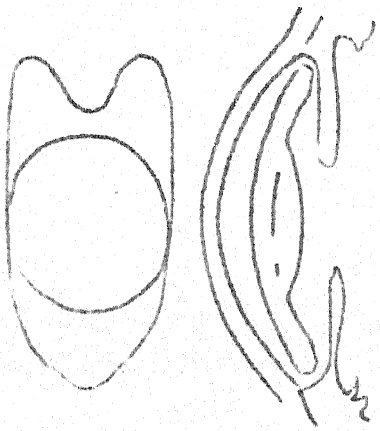
BARRAQUER



BARRAQUER



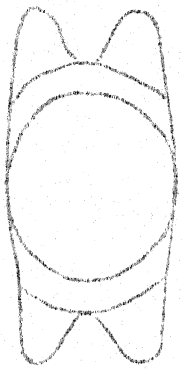
BOBERG-ANS



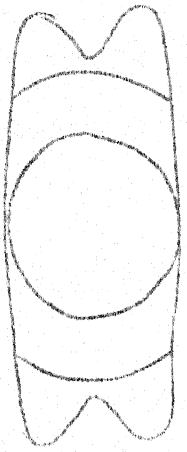
CHOYCE MARK-I

MODERN ANTERIOR CHAMBER ANGLE FIXATED INTRAOCULAR LENSES

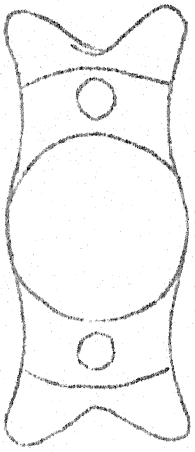
R: rigid; S: semirigid; F: flexible; M: mixed.



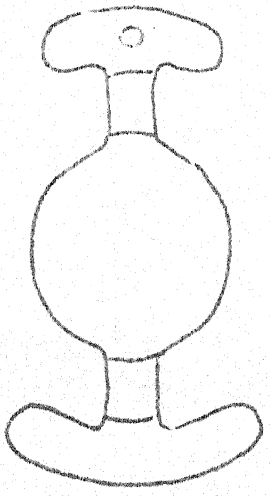
CHOYCE MARK VIII LENS(R)



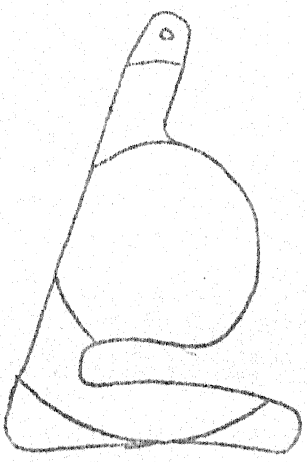
CHOYCE TENNANT LENS(R)



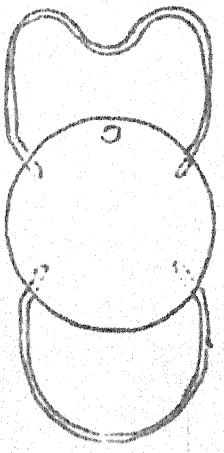
CHOYCE MARK IX LENS(R)



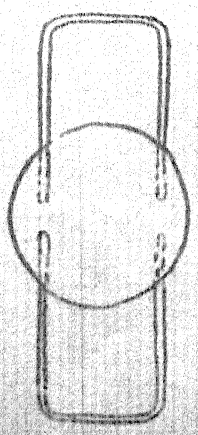
TENNANT ANCHOR LENS(S)



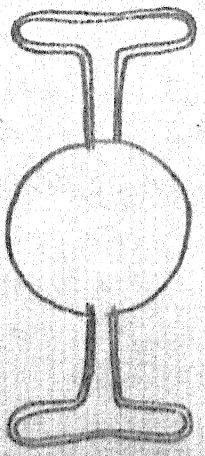
KELMAN "PREGNANT 7" LENS(S)



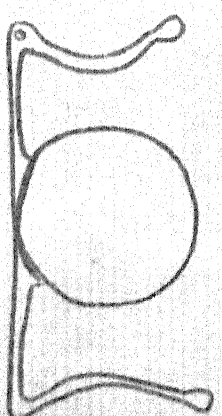
AZAR PYRAMID II LENS(S)



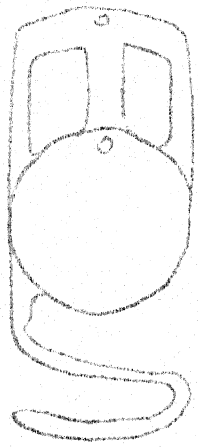
LEISKE LENS(S)



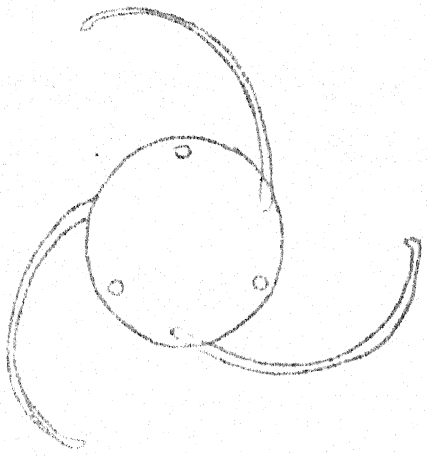
HESSBURG LENS(S)



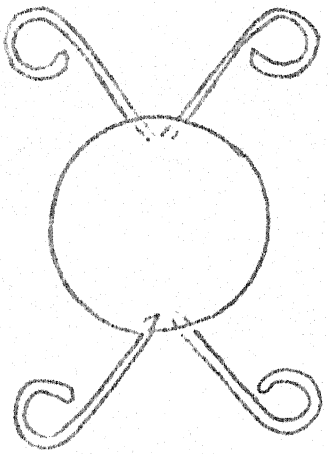
KELMAN QUADRIFLUX LENS(F)



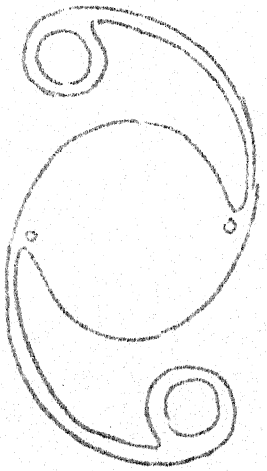
TENNANT ANCHOR FLEX LENS(M)



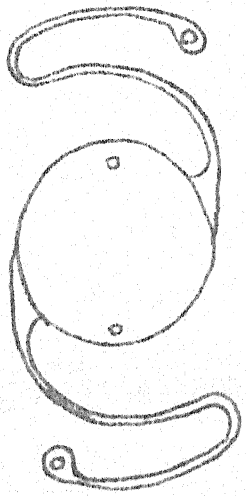
DUBROFF LENS(F)



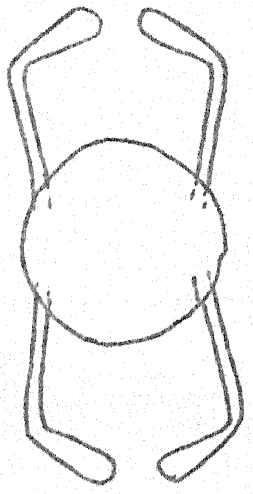
SHEOPARD UNIVERSAL LENS(F)



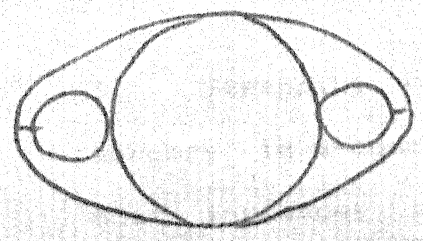
PANNU LENS(F)



SOFT-S-LENS(F)



STABLEFLEX LENS(F)



WORST IRIS-CLAW LENS(R)

Complications of Anterior chamber lens implantation

(A) **During Surgery**

1. Conjunctival flap. A too large limbus - based conjunctival flap is a hindrance when folded back it makes the visualization of anterior chamber difficult. Also a large flap of any kind can contribute to postoperative acquired Ptosis Alpar 1982[5]. It is better to have a 1 mm conjunctival miniflap which just allows the lifting of the cornea with the conjunctival flap (Castroviejo, 1967)[6]. Better yet to have a small fornix based flap that leaves the limbus free of conjunctiva during surgery[7].

2. **Incarceration of haptic into the wound**[6] especially during the learning phase, often the condition is not detected until the first postoperative examination. During surgery the position of all feet must be ascertained under direct visualization. The offending foot or feet must be placed in the proper position at the time of surgery.

S. Bharati et al 1984-1986 described about difficulty in implantation of the IOL and tucking of the iris and breaking the foot of the IOL during anterior chamber implantation Subhash P. Kadam 1987 reported that lens loop may be engaged in the iris, if pupil is kept dilated during implantation.

3. **Stripping of Descemet's membrane**[85] during cataract surgery is a common occurrence, the amount of stripping in most instances is minimal and rarely leads to permanent difficulties[7,29] except a slight corneal oedema which leads to corneal scar visible only on slit-lamp examination. The

detachment of descemet membrane is 1/3 or more it will lead to corneal decompensation and therefore it should be reposited by paracentesis or injection of air or cushion materials like 1 % sodium hyaluronate and sometimes a through and through corneal suturing may be required with 10-0 nylon or polypropylene mattress suture.

4. **Hyphaema** it is a common complication during intraocular surgery that is only one should be careful to prevent it from conjunctiva or episcleral vessels by careful curving of limbal incision towards the cornea on either side i.e. 3 O'clock and 9 O'clock. The blood left in the anterior chamber can clot easily and rapidly making its removal difficult. It obstructs proper vision and can result in drawing up the pupil (Fechner)[6] the source of bleeding may be from iris and Schlemn's canal. Subhash P. Kadam (1987)[53] in his series of 146 patients hyphaema was encountered in 18 cases. S. Bharati et al. 1984-1986[21] reported that it is usually not significant and stops spontaneously. Dupont Guerry and Walter J Geeraets in 1962[36] reported hyphaema in 2 cases out of 27 cases.

5. **Intraoperative shallowing of the anterior chamber** - Prolapsing of iris and bulging vitreous are not always signs of expulsive haemorrhage. Often the adjustment of drapes, of speculum or of bridle sutures solves the problem. If general anesthesia is given the systemic administration of curare-like substances and the application of positive-negative pressure in breathing might help to lower the orbital pressure. Patient might need to be repositioned in a reverse

trendelenburg position. The bladder needs to be emptied. The chamber should be closed immediately with sutures and air or 1 % sodium hyaluronate or 2 % methylcellulose is injected. After a few minutes the anterior chamber may be reopened suture by suture. If the anterior chamber remains deep the danger has passed. MC Nahata 1983[61] reported vitreous bulge in 2 cases, bulging of iris lens diaphragm in 2 cases in a study of 20 cases. Subhash P. Kadam 1987[53] reported positive vitreous pressure in 4 patients out of 146 cases. S. Tony Fernandez 1989[42] stated that with the use of visilon these complications were nil.

Dupont & Walter J Geeraets 1962[36] reported 7 cases out of 27 cases.

(B) POST OPERATIVE COMPLICATIONS

EARLY COMPLICATIONS

1. Shallow or Flat anterior chamber

A shallow or even more a flat anterior chamber is an absolute emergency in eyes that have any kind of IOL especially anterior chamber IOL. Contact between IOL and the corneal endothelium is extremely damaging to the corneal endothelium. The majority of such cases result from wound leak (Alpar & Fechner 1988)[8]. The chamber should be filled with methyl cellulose or sodium hyaluronate before the wound is resutured.

Daljit Singh et al. 1983[74] reported the incidence 1.6 %. S. Bharati et al. 1984-86[21] also found 1.6 % incidence of shallow anterior chamber.

If the shallow anterior chamber is caused by pupillary block, which can be removed at once by using strong mydriatics as a first step (Fechner 1988)[6].

2. **Secondary glaucoma** - Rise in intraocular pressure is a multietiologic entity. Enzymatic zonulysis, strong water tight wound closure intensive corticosteroid treatment, cauterization of emissary and aqueous veins, post-operative swelling of the trabecular meshwork in corneoscleral incision, plugging up the meshwork with cortical material and protein, intra-cameral methylcellulose, chondroitin sulphate and sodium hyaluronate (Alpar & Fechner 1988)[6].

J Watts 1979-83[82] reported 2 cases of glaucoma out of 44 cases of anterior chamber IOL. Daljit singh et al. 1984[75] reported 8.33 % incidence of glaucoma in an experimental study on rabbits. O.P. Billore et al. 1984[23] found 7.92 % incidence in rigid anterior chamber IOL & 1.6 % in flexible loop anterior chamber IOL. S. Bharati et al. (1984-86)[21] encountered acute glaucoma in his study of 158 cases. R.K. Mishra 1985[58] reported on 7th day after operation 1.6 % on 15th & 0.54 % on 45th day in a study of 185 cases. Subhash P. Kadam 1987 described secondary glaucoma as a late complication on long term study and reported 13 % in a group of 912 patients. V.K. Bidaye (1988)[22] reported 2 % incidence. R.K. Mishra et al. 1989[58] reported 3.1 % incidence in a group of 53 cases.

Most cases of secondary glaucoma correct themselves in a few days but the pressure elevation however may be high enough to cause permanent damage and visual loss especially

in patients whose optic nerve and intraocular vascular status is already embrassed. For this reason all post-operative glaucomas should be treated with carbonic anhydrase inhibitors, betablocking drugs, systemic hyperosmotic drugs or reduction of corticosteriods (Alpar Fechner 1988).

Pupillary block glaucoma

Barraquer 1962[12], Bresnick 1969[20] and Van Buskirk 1983[84] reported pupillary - block glaucoma as a complication associated with anterior chamber IOLs. Bresnick have described rotation of anterior chamber IOLs with subsequent occlusion of a single patent iridectomy. Van Buskirk 1983 described that some cases may progress to significant visual loss.

Alpar Fechner (1988)[9] described that if the iridictomy has been inadequate or closed a new iridectomy must be performed surgically or preferably by Nd: YAG laser if available.

Air block glaucoma can also occur if too large an air bubble left in the anterior chamber at the end of surgery as it blocks peripheral iridectomy and pupillary opening. This is treated with Acetazolamide 1500 gm and IV 250 ml mannitol 30 % as a rule, if the pressure not relieved removal of air was advocated with the help of a fine needle and replaced with balanced salt solution (Fechner 1988)[9].

Ghost cell glaucoma - Intraoperative haemorrhage may occur as a result of iris or ciliary body erosion, an iridectomy too close to the iris root or vitreous loss or other iris damage. If larger quantity of blood is collected in the vitreous degenerated blood cells (ghost cells) may float in to the anterior chamber and block the trabecular meshwork (sometimes after a few week). If medical treatment fails then lavage of anterior chamber and vitrectomy is done to remove these ghost cells (Fechner 1988).

Striate keratitis - In the early postoperative period suggests traumatic surgery the longer it takes for the striate keratitis to disappear the more traumatic the surgery was and the worse prognosis. It is due to the impairment of fluid pumping function of endothelium Fechner (1988)[9].

NS Raju 1983[69] reported 2 cases out of 12 patients. MC Nahata 1983[61] found it in 15 cases in a group of 20 cases. Daljeet Singh et al. 1983[74] found slight striate keratitis in 19.6 % and moderate in 9.8 %. Daljeet Singh[75] in an experimental study on rabbit in 1984 reported 18.1 % with visilon and 12 % in IOL without visilon. RK Mishra 1985 reported 70 % incidence of mild to moderate striate keratitis. In a series of 60 IOLs S. Tony Fernandez 1986[42] encountered 6 cases with visilon and 4 cases without visilon. OP Billore et al. 1986[23] found incidence of 29.5 % with rigid anterior chamber IOL and 19.82 % with flexible IOL in study group of 500 patients. Subhash P. Kadam 1987[55] reported incidence of striate keratitis in 8 cases out of 146 cases. Vilas Bidaye 1988[22] reported 2 cases out of 100 cases.

Iridocyclitis can be due to infection or due to surgical manipulation or as a response to transient breakdown of blood aqueous barrier MC Nahata 1983[61] reported 20 % incidence. Daljeet Singh et al. 1983[74] reported 11.5 % severe uveitis, NS Raju 1983[69] reported 8.66 % cases of persistent uveitis. RK Mishra et al. 1985[58] reported 22 % mild, 63 % moderate and 11 % severe iridocyclitis in a group of 185 patients. OP Billore et al. 1986[23] reported 14.7 % uveitis with rigid anterior chamber IOL and 9.8 % with flexible IOL. Subhash P. Kadam 1987[55] reported 17 cases of mild, 6 cases of moderate and one case of severe iridocyclitis out of 146 cases. Vilas Bidaye 1988[22] reported 2 % incidence of iridocyclitis.

This may be minimized by the administration of prostaglandin inhibitors such as Indomethacin. The incidence of severe uveitis has decreased markedly with improvements in surgical techniques better IOL fabrication techniques and better IOL design. Daljeet Singh 1982[76] reported 2 % severe and 3.6 % mild uveites in a series of 138 cases of iris claw IOLs. GA Suttan 1980 reported 4 cases of protracted uveitis out of 101 cases of IOL implantation by surgeons in training. JP Burke, HE willshaw and JDH UYoung 1989[24] reported 3 cases of fibrinous uveitis out of six anterior chamber IOL in uniocular cataracts in childhood. George H. Bresnick 1969[44] reported, out of 17 eyes with IOLs enucleated severe iridocyclitis was a prominent clinical and pathological finding in five cases.

Infectious endophthalmitis usually becomes manifest around the 2nd or 3rd post operative day. (a date modified if

peribulbar antibiotics and/or steroids were given in the OT) a notable exception being staphylkococcus epidermides endophthalmitis which become symptomatic after 5 or 6 weeks of surgery. Fungal endophthalmitis is a late complication that presents 2 or more weeks after surgery. In 1975 & 1976 two major outbreak Apple DJ et al (1984)[12] & Aplar Fehner (1988)[9], the cause of these outbreak was contamination of neutralizing solution (sodium bicarbonate) 13 patients developed fungal endophthalmitis following IOL implants in 1975 and in 1976, 8 cases had pseudomonas aerogenous endophthalimitis. YM Paranjpe 1983[64] reported no case of endophthalmitis in his series of 25 patients. RK Mishra et al 1985 also didn't report any case of endophthalmitis. S Bharati et al 1985 reported incidence of iritis and endophthalmitis in his study of 158 cases. Subhash P. Padam 1987[38] reported one case after 19 weeks of operation out of 146 cases.

Sterile endophthalmitis Toxic lens syndrome can occur few days or even a few weeks following an often uneventful implantation of an IOL, pigment precipitation on lens surface, hypopyon and vitreous opacification develops in single or mixed form of variable duration and severity. The eyes are usually relatively painless, hardly red and little or no chemosis is present Alpar (1982)[10]. Apple DJ et al. 1984[12] reported 7 % incidence in dry pack and 15 % in case of wet pack sterilized IOLs. Eichenbaum & co authors 1978[37] reported on treatment all eyes of bacterial endophthalitis were saved with some retention of vision.

Zaidman and Mondena 1982[89] have shown that response to treatment and final visual acuity in five patients with postimplantation bacterial endophthalmitis did not appear to be related to retention or removal of IOL.

Precipitates[9] on the IOL and Anterior Vitreous face

Alpar Fechner 1988 stated pigments on the IOL and on anterior vitreous face usually disappear in a few weeks or months their, their reappearance signifies a flare up of uveitis and might be a first sign of CME, the best way to prevent the formation of precipitates of any kind (pigment, blood cells protein etc.) is careful control of bleeding during surgery, irrigation of anterior chamber during surgery, atraumatic surgery postoperative dilatatiion of pupil especially in younger patients and control of post-operative inflammation.

Apple DJ (1984)[12] stated that this occur especially during the immediate post-operative period and frequently clear spontaneously as the operated eye quiets down, but if an inflammation becomes chronic or haemorrhage occurs such as in UGH syndrome, the precipitates may coalesce and become sufficiently dense as to cause decreased vision.

Complications occurring at various times postoperatively.

Lens Dislocations

Even 10^{o} tilt of the lens in chamber fluid can give good quality 20/20 vision as the power of lens measured in air is three times as strong than that of lens in water. Dislocation of chamber angle-fixed lens usually manifests

through rotation inside the eye and occurs usually when the lens is too small. If the lens is narrow sufficient edge glare might be present. If the lens is tilted anterio-posteriorly it may rub against cornea. Therefore too small and tilted lenses should be removed and replaced surgical shortcuts (no iridectomy, leading to glaucoma and or dislocation) i.e. iatrogenic dislocations. Traumatic lens dislocations may occur at any time with any lens, IOLs especially the rigid haptic can act as introocular missiles Fechner (1988)[9].

David ben Ezra and Juan H paez 1983[30] reported one case of traumatic dislocation of IOL out of eight IOLs in congenital cataract.

Ezra Maguen, Anthony B Nesburn, Norman Jackman and Jonathan I Macy 1985[41] reported a case of semiflexible IOL that broke inside the patient's eye approximately nine months after implantation without H/Ø trauma. This lead to inferior corneal oedema progressing towards the optical axis with progressive decrease in endothelial cell density.

Intermittent touch syndrome and IOL corneal touch[73]

It may cause continued loss of corneal endothelial cells and subsequent corneal problems.

Drews 1982[32] described the syndrome of intermittent touch as triad of findings ciliary flush, localized corneal changes.

Fachner described that some or all of the following symptoms are present :

1. FB sensation without FB
2. Persistent or recurrent ciliary flush.
3. Recurrent, later persistent and progressive corneal oedema near the feet of anterior chamber angle fixed lenses.
4. Progressive endothelial cell loss
5. Recurrent iritis of variable severety
6. Iris pigment disturbances
8. Vitritis
9. Erythropsia, metamorphosia, muscae volitantes
9. Cystoid macular oedema.

Cystoid macular oedema[43,49&73]

It is a well known complication of cataract surgery with or without IOL and especially after intracapsular cataract extraction. It is not entirely clear whether CME is the result of an increased permeability of perifovealar capillaries, is caused by ischaenic tissue injury, is secondary to intraocular inflammation or from direct traction on the macular following vitreous shifts there may be a combination of factors (1984)[29]. A relationship to anterior segment inflammation associated with prostaglandin release, and concurrent corneal decompensation and CME (The corneal-retinal inflammatory syndrome) has been reported by Obstbaum & Galin in 1979[62]. Galin 1977 reported that approximately 70 % of affected patients will have spontaneous resolution with visual improvement.

Daljit Singh 1982[76] described 2-3 % cases clinically and 40-50 % cases angiographically. J. Watts 1979-1983 in a

study of 44 anterior chamber IOL one case developed CME.

MC Nahta 1983[61] found one case of CME out of 20 eyes. NS Raju 1983[69] reported one case out of 12 eyes.

RK Mishra et al. 1985 found CME 15.8 % on 7th day 1.6 % on 15th day 2.2 % cases and on 30th day in 10 % cases. He reported that CME disappeared in 2 months in 14 %, in 3 months in 7.8 % cases and in 1.6 % cases it remained unresolved in six months. Subhash P. Kadam 1987[53] found six cases of CME out of 158 cases. S. Tony Fernendez et al. 1986 in a study group of 60 cases did not encounter any case with CME. RK Mishra in 1989[58] reported 10 % incidence. The incidence of macular oedema was in 665 cases out of 27919 cases of anterior chamber intraocular lens implantation as reported by Davidson 1986[31] in Recent advances in ophthalmology. The Miami study group 1979[57] concluded in his study that cystoid macular oedema after AC lens implantation is comparable to that following non-implant surgery in case of intracapsular cataract extractions.

Late Complications:

Corneal endothelial decompensation -

It can occur if large amounts of endothelial cells were lost during surgery, if formed vitreous remains in contact with the damaged endothelium in case of prolonged severe iritis, in case of endothelial damage. Coupled with prolonged high entraocular pressure, in case of intermittent touch syndrome in case of barrier deprivation syndrome, in case of severe peripheral anterior synechiae and in case of prolonged toxic lens syndrome. The speed of decompensation

varies, the outcome is the same. Severely decreased vision and eventually quite often bullous keratopathy. The IOL implantation after cataract extraction may be more harmful to corneal endothelium than simple cataract extraction (Alpar & Feecher 1988)[7-9], Hirst et al 1977[48] found 14 % endothelial cell loss in cataract with implant. Knight 1978 reported 10 % loss of endothelial cells. Drew & Waltman 1978 reported 11.6 % after uncomplicated cataract extraction with implant as compared to 4.1 % after cataract operation without IOL Kraff et al 1978 reported that in complicated lens implantation, especially with presentation of vitreous the cell loss increased to 65.5 %. Little 1979 reported that in clear cornea with descemet membrane folds cell loss was 0-10 %, in striate keratitis cell loss was 15-35 %, in the cornea with firm epithelial oedema cell loss was 35-60 % and in the area of bullous keratopathy cell loss was 50-70 % in cloudy cornea cell loss was more than 70 %. John Alpar, Paul U. Fechner in 1986[7-9] described the same findings. Gould 1980 reported 50 % average cell loss. Worst 1984 reported that even momentary contact between PMMA and endothelium caused 20 to 30 % cell loss in rabbit and human cornea. Apple DJ et al. 1984[12] reported 1.2 %. Cornelis D. Binkhorst Per Nygaard & Leo H. Loones[19] reported intracapsular pseudophakic eyes had an average cell defecit of 38 %. George H Bresnick 1969[44] reported advanced corneal endothelial dystrophy the primary cause for enucleation in six cases out of 17 eyes enucleated. Incidence of bullous keratropathy in a year's follow up, RK Mishra 1985 reported 1 % incidence out of 185 cases. OP Billore et al. 1986[23] reported corneal oedema in 7.9 % in rigid type anterior

chamber IOL and 16.72 % in flexible anterior chamber IOL and corneal decompensation 2.7 % with rigid anterior chamber IOL and 11.47 % with flexible anterior chamber IOL in a series of 500 patients. Daljeet singh 1980 reported endothelial corneal degeneration in 2 cases out of 7 cases of IOL implants. MC Nahata 1983[61] reported persistent corneal oedema in 3 eyes out of 20 eyes. Jonathan M. Frantz 1988 reported 28.5 % endothelial cell loss in 3-6 months period. AB Azar 1987 in a study of 912 anterior chamber IOL corneal oedema was 12 %. J Watts 1979-1983[82] did not report any case of corneal decompensation.

Iris Adhesions around the haptic of flexible loop lenses.

Dupont Guerry & Walter J. Geeraets 1962[36] reported 12 cases of fine synechiae between iris surface and loop out of 27 cases.

Adhesions around the haptic of flexible loop lenses were also observed by (Fechner 1988).

Iris tuck entrapped fold of peripheral iris tissue in the angle by haptic, usually occur during insertion, if IOL is angled posteriorly. An oval pupil with vertical axis parallel to the axis of the IOL is characteristic, but this may not be readily apparent when the pupil is partially dilated at the time of surgery. J Watts 1979-83[82] did not encounter iris tuck. Daljeet Singh 1980 did not report iris tuck in his study. Subhash P. Kadam 1987[53] found 6 cases of iris tuck out of 146 cases. OP Billore et al. 1986[23] reported iris tuck in 22.02 % with rigid IOL and 8.19 % with flexible IOL. RK Mishra 1985 reported 15 % cases of iris tuck out of 185 patients.

Chafing of iris, UGH and VIP Syndrome

Certain lenses especially the rigid angle fixed lenses of the injection, molded variety or lenses with rough poorly polished edges, positioning holes, injection ports can lead to loss of iris, tissue haemorrhage, uveitis, vitritis and secondary glaucoma (VIP Syndrome), Fechner (1988)[7-9] RK Mishra (1985) reported 10.9 % mild iris atrophy, 1.6 % moderate and 2.1 severe iris atrophy.

Dupont & Walter J. Geeraets 1962[86] also reported iris atrophy in a period of 1 year follow up of AC IOLs cases.

Visual results

YM Paranjpe 1983[64] out of 25 cases 4 cases had 6/6 and 21 eyes 6/12 visual acuity.

MC Nahata 1983[61] out of 20 cases visual achievement was 6/12 by 60 %, 6/18 by 26.7 % and 6/60 by 12.3 %.

J. Watts 1984[82] reported 6/12 or better vision in 92 % and less than 6/12 in 8 % cases in a group of 181 cases.

S. Bharati et al. 1985[21] reported 6/6 visual acuity by 36.70 %, 6/9 by 47.46 %, 6/12-6/18 by 12 %, 16/24-6/36 by 3 % and 4/60 by 0.63 %.

OP Billore 1986[23] reported 6/12-6/6 by 78 % and 6/36-6/18 by 15 % and 6/60 by 7 %.

By S. Tony Fernendez, 1986 visual achievement in 60 IOLs were 6/6 to 6/12 by 70 %, 6/18 to 6/36 by 26.2 %, causes of low vision were macular changes in 8 eyes, corneal

opacity in 4 eyes, no reason was found in 4 cases. Four eyes did not require correction for distant vision, 14 eyes required sphere but no cylinder, 18 eyes required cyulinder upto +4D and 2 eyes required above 4D cylinder.

RK Mishra et al 1987[58] reported visual achievement 6/6 - 6/9 by 35 %, 6/12 - 6/18 by 46 %, 6/24 by 14.6 % and 6/60 by 6.5 %. Binocular vision was very good in 40 %, good in 39 %, satisfactory in 9 % and poor in 12 %. As far as patients satisfaction was very good in 49 %, good in 30 %, satisfactory in 14.5 % and poor in 6.5 %.

Vilas Bidaye 1988[22] reported 6/6-6/12 achievement by 64 %, 6/12-6/24 by 28 %, 6/24 - 6/60 by 7 % and 6/60 by 1 %.

Daljeet Singh 1982[76] reported visual results in a series of 138 IOLs: 6/5 : 9 case, 6/6 : 34 cases, 6/9 : 38 cases, 6/12 : 29 cases, 6/18 : 15 cases, 6/24 : 4 cases, 6/36 : 4 cases, 6/60 : 3 cases and less than 6/60 : 2 cases. He also reported that patients who attained vision less than 6/12 there were explainable ocular disorder unrelated to the implanted lenses.

Roper Hall 1979[72] reported 94 % good visual results with a follow-up period of more than 2 years. GA Sutton 1980[81] during a period of follow up from 12 months to a maximum of 6 years reported 63 % eyes with IOLs attained visual acuity of 6/9 or better, 9 % attained 6/12 & 25 % attained 6/18 to hand movements. In this series all surgery was performed by surgeons in training J. Gibson 1980[59]

reported visual acuity 6/6 to 6/12 in 84 cases, 6/18 to 6/60 in 14 cases and less than 6/60 in 2 cases out of 100 cases of IOLs. Out of these 2 cases of poor vision one case had an iris prolapse causing shift of the IOL so that it touched the cornea and implant had to be removed. The other case had severe corneal oedema which required a corneal graft. He also reported postoperative astigmatism on an average 2.84 D. There were 2 cases with +6D, 3 cases of 5.5 D cylinder.

Percival & Yousef 1976[67] reported average postoperative astigmatism of less than 1.5 D in a series of 25 cases.

JB Burke, HE willshaw and JDH Young 1989[24] reported IOLs in 20 children with cataract (Seven Traumatic, 13 non-traumatic) out of them six had anterior chamber IOLs. Out of these six AC IOLs one had good visual acuity 6/4, two had 6/24 - 6/36 and three had visual acuity 3/60 to 2/60 in a follow up period of 2-4 years.

David Ben Ezra & Juan H Paez 1983[30] reported visual results in eight eyes after intraocular lenses in congenital monocular cataracts in children. Six children participated in their regular activities with sound eye occluded, in three children visual acuities could be recorded with E. Chart 20/100 in one case and 20/40 in two cases. In all eight eyes the anterior segments and the fundi are normal.

Epithelial down growth - It is a complication of the cataract operation and not that of the IOL. However, the presence of IOL creates a special problem because the downgrowth can envelope the IOL, and removal of IOL in these

cess is mandatory. (Fechner & Alpar 1988)[7-9] If left alone it will cover the chamber angle leading to glaucoma and blindness. George H Bresnick 1969[44] reported four cases of epithelialization of the anterior chamber out of 17 eyes enucleated with IOL.

Retinal detachment

The frequency of retinal detachment is about the same for pseudophakic and aphakic eyes. There is However, a significant difference between routine uncomplicated intracapsular 3 % and extracapsular 0.9 % (Fechner & Alpar 1988)[11]. Percieval etal. 1983 reported the same results. The use of anterior chamber angle-fixed lenses permit maximum dilatation of the pupil and the very adequate visualization of the retina. In 1976 Duffner LR Wallace WK, Stiles WR[35] & Galin MA, Poole TA & Obstbaum SA 1979[62] reported 0.6 to 2.4 % incidence of retinal detachment in ICCE with iris supported IOLs. 1980 J. Gibson Moore[59] reported 1 % incidence of retinal detachment. S. Tony Fernendez et al 1986 reported retinal detachment in one case out of 60 IOL implants. J. Watts, Jonathan Daljeet Singh OF Billore M Frantz S Bharati and Subhash P. Kadam reported no case of detachment in their series of IOLs..

Light maculopathy, Erythropsia

Although the natural lens filters the greater part of ultraviolet light out, the PMMA hardly presents a barrier and the cornea filters only 20 % of the near ultraviolet light to the retina. Erythropsia (pink vision is an acute phenomenon) that occurs to a patient with an ocular system

that does not filter out the near ultraviolet rays. Repeated attacks of erythropsia almost surely will lead to permanent damage of the retina due to macular oedema (Fechner & Alpar 1988) Until the safety of ultraviolet filter IOL is established one may consider using the ordinary IOLs and fitting ultraviolet filtering spectacles (Fachner 1980)[11].

Light induced

Optical properties of the lenses especially those that have optic in front of iris permit an internal reflection of the light causing the appearance of flashing of lights, shimmering of objects etc. (Fechner & Alpar 1988)[11].

MATERIAL AND METHODS

MATERIALS & METHODS

The present study was carried out in the Department of Ophthalmology, M.L.B. Medical College, Jhansi. In thirty patients anterior chamber IOL implantation was done after cataract extraction.

The patients selected for IOL were usually senile cataracts with a willingness for IOL implantation.

A detailed general and ocular history of the patients was taken with special reference for any history of diabetes, hypertension, asthma rheumatoid arthritis, scleroderma, cerebrovascular insufficiency. In ocular history special attention was given on the refractive condition of the eye prior to the development of cataract.

A detailed general examination of the patients was done with special attention for any sign of diabetes, hypertension, asthma, rheumatoid arthritis, scleroderma cerebrovascular insufficiency, thyroid disease and enlarged prostate and psychiatric problem.

A detailed local examination of all patients was carried out, by focal illumination, slit lamp examination retinoscopy & fundus examination and intraocular tension was recorded.

Patients who were having diabetes, corneal endothelial dystrophy, iritis, iris atrophy corneal opacity, keratitis, glaucoma high myopia, complicated cataract keratoconjunctivitis sicca and any history of retinal detachment and single eyed patients were not selected for IOL implantation.

Intraocular lenses

Flexible open loop angle fixated anterior chamber lenses of J-loop shape (Shah & Shah) were used. These lenses were sterilized[4] by ethylene oxide, dry packed and made of polymethylmethacrylate.

Determination of power of IOL to be implanted

I. A detailed history regarding refraction of the eye prior to the development of cataract was taken and the power of lens to be implanted was calculated by the following formula devised by RC Drews, 1977[33].

The power of the anterior chamber intraocular lens is 18 + (Primary refractive error x 1.25).

II. Retinoscopy was carried out on the operation table. After lens extraction visilon was injected into the anterior chamber and retinoscopy was done.

Preoperative preparation

The night before operation patients were given mild sedation with diazepam tablet, Diamox 500 mg[70] for reducing intraocular pressure. Antibiotic eye drops were instilled one day prior to operation.

On the morning of operation pupil was dilated with Drosyn 10 % and tab Diamox 500 mg were given, two hours before operation. On the operation table IV 20 % mannitol[77] 250 ml was given about 20 minutes before the operation.

Anesthesia[83&88]

1. Topical 4 % Lignocain as drops.

2. Facial block by lignocain 2 % with adrenaline 1:100000

3. Retrobular block with lignocaine 2 % alongwith adrenaline 1:100000

Operative steps

Part prepared and drapped lid sutures were applied in the upper and lower lids and fixed, then superior rectus fixation sutures were applied. A small limbal section from 3 O'clock to 9 O'clock was made with the help of razor blade and spring scissor and a suture was passed at 12 O'clock position. Intracapsular lens extraction was done with the help of cryoprobe or by capsule holding forceps. The cases having vitreous loss or accidental extracapsular cataract extraction were excluded from the present study. After lens extraction anterior chamber was reformed by injecting Visilon and then IOL was implanted in the anterior chamber. The section was closed with five to seven corneoscleral sutures of 8-0 monofilament.

The intraoperative complications were recorded.

Postoperative treatment

Tab Septron 2BD }
}
Tab Ibuprofen 400 mg ITDS } for a week
}
Cap B complex with Vit C 1 OD }

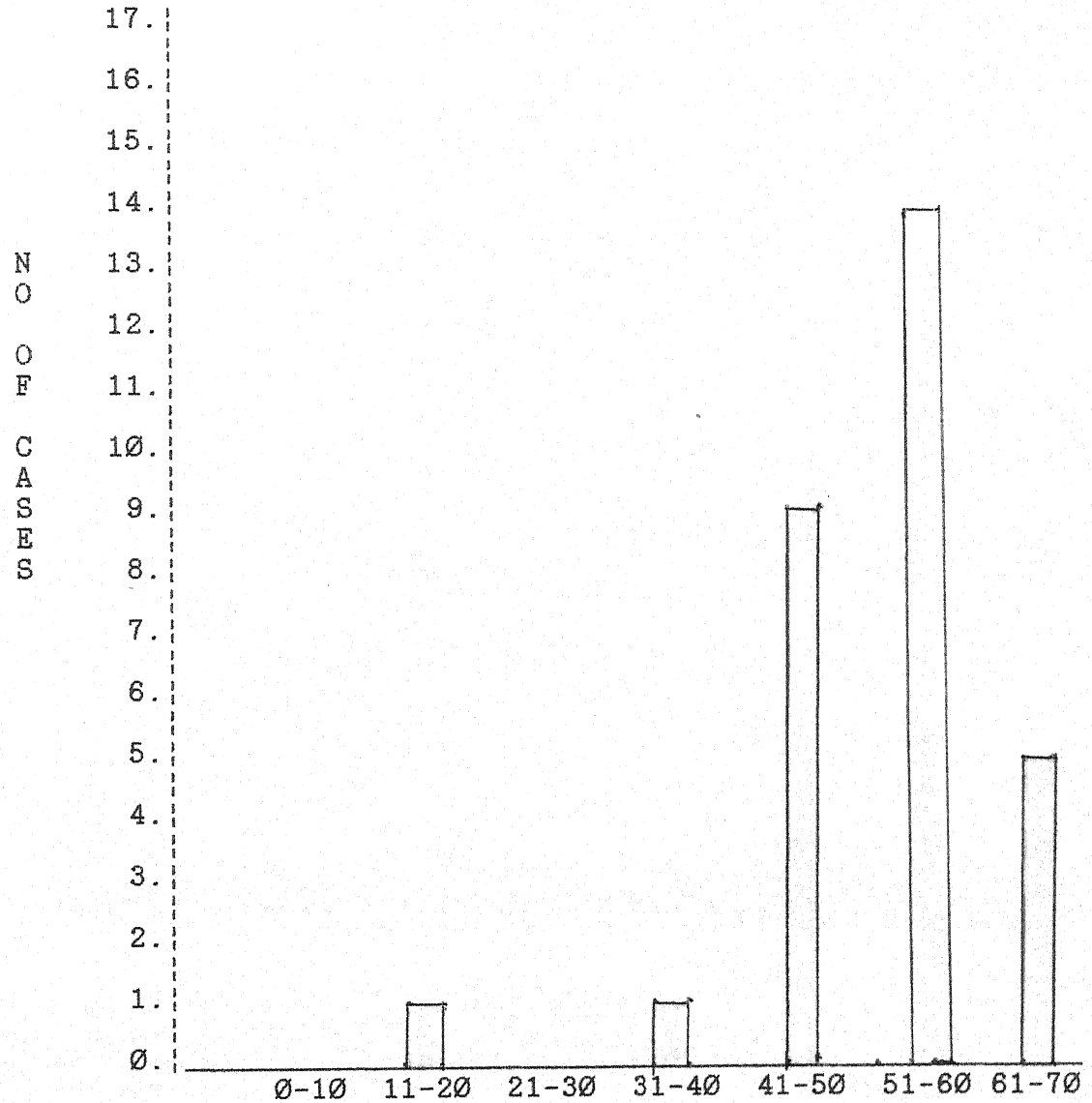
Daily dressing were done and detailed examination of the eye was done and noted. Patients were discharged from the hospital on 7th day.

After the discharge

Follow up was carried out every week for two weeks and stiches were removed on 1st follow up. Later on the follow up was done every fortnightly for about a period of 6-2 months.

During the period of follow up and at the time of discharge a detailed local examination was carried out as shown in attached proforma i.e.

OBSERVATION



AGE DISTRIBUTION (IN YEAR)

The table 3 shows the distribution of age and sex of the patients. Most of the cases are male and the youngest patient in the study group was 20 year old and eldest was 70 year old and the average age was 60 year. Out of these cases 12 were female and 18 were male.

Table 3

Distribution of age & sex of the patients

S.No.	Age group	Sex				Total	
		Male		Female			
		No.	%	No.	%	No.	%
1.	00-10	-	-	-	-	-	-
2.	11-20	1	3.3	-	-	1	3.3
3.	21-30	-	-	-	-	-	-
4.	31-40	1	3.3	-	-	1	3.3
5.	41-50	6	20	3	10	9	30
6.	51-60	8	27	6	20	14	46.6
7.	61-70	2	7	3	10	5	16.6
Total	-	18	60	12	40	30	100

Complications occurring at the time of operation has been shown in the table No. 4. (Cases with retrobulbar hemorrhage, vitreous loss or vitreous in anterior chamber and rupture of lens capsule or unplanned extracapsular extraction were excluded from the present study).

Table 4

Complications during surgery

S.No.	Complications	No.	Percentage
1.	Corneoscleral wound	-	-
2.	Hyphaema	2	6.6
3.	Incarceration of Haptic into the wound	1	3.3
4.	Descemet Membrane Detachment	-	-
5.	Intra-operative shallowing of the Anterior chamber	2	6.6
	Total	5	16.5

Hyphema developed in two cases. In one case it developed after iridectomy and in the second case it

developed during the implantation of IOL due to trauma of wound. It was resolved in both the cases within 4-5 days, with the treatment tab Dimox 1BD and haemostatic drugs (Injectable at the time of operation and orally 1TDS).

In 1 case the haptic was incarcerated into the wound, it was reposited into the chamber and the wound was restitched.

Shallow anterior chamber during operation was observed in two cases. It was due to bulging of vitreous and iris. In these cases we closed the wound with corneoscleral sutures immediately and lid and superior rectus sutures were also loosed, and waited for the settlement of the bulging iris and vitreous. It was settled down in both the cases within few minutes. Then we re-opened the wound, and IOL was implanted.

Table 5

Early post operative complication

S.No.	Complication	No.	Percentage
1.	Striate Keratitis	8	26.6 %
2.	Corneal oedema	1	3.3 %
3.	Flat/Shallow anterior chamber	1	3.3 %
4.	Iridocyclitis	6	20.0 %
5.	Hyphema	3	10.0 %
6.	Raised intraocular pressure	1	3.3 %
7.	Iris tuck	-	-
8.	Incarceration of haptic into the wound	1	3.3 %
9.	Riding of pupillary margin over IOL	1	3.3 %
10.	Precipitate deposition on IOL	3	10.0 %
11.	Pigmentary deposits	1	3.3 %
12.	Distortion of pupil	3	10.0 %
13.	Pupillary capture	-	-
14.	Choroidal detachment	-	-

In the early post operative complication, the striate keratitis was present in 8 (26.6 %) cases. It resolved in

most of the cases within a period of 4-6 days except in 2 cases, it persisted for a longer time. Out of these 2 cases, it disappeared in a period of 2 weeks in first case and in the second case it took up 3 weeks to resolve.

Corneal oedema was found in one case and it subsided within a weeks.

Shallow anterior chamber was found in 1 case and it resolved within 3-4 days with the treatment of pressure bandage, tabs Diamox 1BD x 3 days and mydriatics.

The Hyphema was noticed in 3 cases. It disappeared within a week in all the three cases.

In the early post operative complication Iridocyclitis was noticed in 6 (20 %) cases. In most of cases it was resolved within 2 to 3 weeks with the treatment of subconjunctival injection of Decadron, Injection Atropine and Injection Gentacin alongwith topical cycloplegic mydriatic antibiotics and corticosteroids and systemic antibiotics anti-inflammatory and corticosteroid drugs except in 1 case it persisted too longer; upto 2 months.

Incarceration of Haptic into the wound was noticed in one case. In which the haptic was incarcerated into the wound at 12 O'clock position, it was treated by re-opening of the chamber in O.T. and reposited it into the chamber and then resuturing of the wound was done.

Raised intraocular pressure was found in (3.3 %) i.e. one case it was due to iritis and retention of visilon in the anterior chamber.

Riding of puipllary margin over IOL was presented in one case (3.3 %). This patient was also having tilt of lens and as a result of which needed astigmatic correction. This overriding got corrected by itself within a period of 6 weeks.

Preceipitate deposition on IOL was encountered in 3 cases (10 %) and all these cases had iridocyclitis. The precipitate depostion cleared in two weeks time after the treatment of iridocyclitis.

Pigmentary deposits were seen in one case (3.3 %). These pigmentary deposits were absorbed within a period of 4 weeks without leaving any ill effect on vision.

Distortion of pupil was observed in three cases (10 %).

Table 6

Complications in late postoperative period

S.No.	Complication	No.	Percentage
1.	Endothelial corneal dystrophy	–	–
2.	Cystoid macular oedema (CME)	–	–
3.	Retinal detachment	–	–
4.	Iris Atrophy	–	–
5.	Uveitis, Glaucoma, Hyphaema syndrome	–	–
6.	Adhesion between iris and IOL	–	–
7.	Persistent Iritis	1	3.3
8.	Flashing of light	4	13.3 %

Persistent iritis was present in one case (3.3 %) it was associated with raised intraocular pressure. It subsided after 2 month with the treatment of subconjunctival decadron

and Atropine injection alongwith local corticosteriod, indomethacin and atropine eye drops and systemic antiinflammatory in the form of Tab Brufen 400 mg 1 TDS and tab prednisolone (5mg) 2TDS.

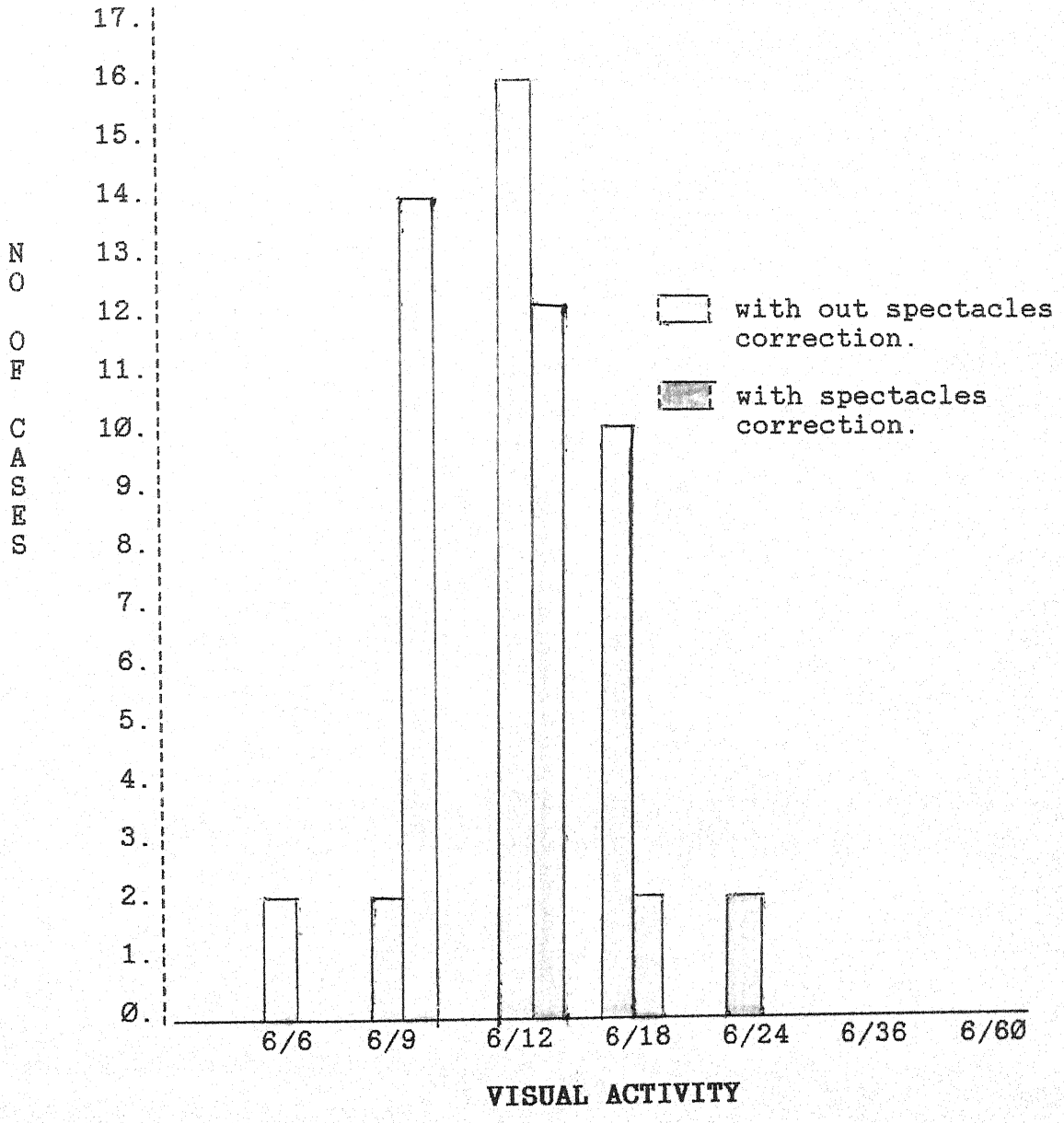
Complaint of flashing of light was there in four cases (13.3. %).

Table 7

Visual Acuity Results

S.No.	Visual acuity	Without Spectacles correction		With Spectacles correction	
		No.	%	No.	%
1.	6/6	-	-	2	6.6
2.	6/9	2	6.6	14	46.6
3.	6/12	16	53.3	12	40.0
4.	6/18	10	33.3	2	6.6
5.	6/24	2	6.6	-	-
6.	6/36	-	-	-	-
7.	6/60	-	-	-	-

The final visual acuity with spectacle lenses was recorded six weeks after operation. Out of these 30 patients, 21 patients had good binocular vision and the rest 9 patients could not achieve binocularty as they were having mature cataract and advanced immature cataract in the other eye. All the patients resumed their normal routine activities after a period of 6 weeks after the operation. 93.3 % cases achieved 6/12 or better vision. Out of these 93.3 % cases 2 patients had 6/6 vision.


17.
16.
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NO OF CASES
with out spectacles correction.
with spectacles correction.
6/6
6/9
6/12
6/18
6/24
6/36
6/60
VISUAL ACTIVITY

Table 8

Different type of spectacle lenses required for maximum visual acuity achievement

Correction of vision	No.	Percentage
No correction for distant vision	-	-
Spherical only	4	13.3 %
Cylinder upto ± 1D	17	56.6 %
Cylinder above ± 1D	9	30.0 %
Spherical + Cylinder	21	70.0 %
Cylinder only	5	16.6 %

INTRAOCULAR LENS IMPLANT IN THE ANTERIOR CHAMBER(Lt.EYE) VISION 6/6 WITH CORRECTION AFTER 8 WEEKS

INTRAOCULAR LENS IMPLANT IN THE ANTERIOR CHAMBER IN FEMALE PATIENT (Lt.EYE) AFTER 3 WEEKS VISION 6/9 WITHOUT CORRECTION

INTERAOCULAR LENS IMPLANT IN THE PATIENT WITH TRAUMATIC CATARACT VISION 6/9 WITHOUT CORRECTION AFTER 2 MONTHS

DISCUSSION

DISCUSSION

Cataract extraction is the most common operation in ophthalmology. It leads to aphakia which can be corrected by spectacle lenses or contact lenses or by intraocular lens implantation. Out of these methods of aphakic correction the IOL implantation is most suitable optically.

These intraocular lens implantation are associated with some complications in addition to the complications of simple cataract extraction.

Complications with the original Ridley's[71] posterior chamber IOLs led to the idea of placing the IOLs in anterior chamber.

The earlier anterior chamber IOL implanted by Baron (1952)[12] led to the corneal endothelium decompensation due to contact of IOL with cornea. Danheim (1952)[12] introduced flexible closed loop anterior chamber IOL. These lenses had nylon haptics which underwent hydrolytic biodegradation leading to irritation of the eye & dislocation of IOL.

Later Epstein 1953[40] introduced iris supported lens and Binkhorst in 1957[15] developed iris clip lenses. These iris clip lens & supported lenses in long term follow up encountered atrophy and erosion of ocular tissue, corneal decompensation and pseudophakic bullous keratopathy, cystoid macular oedema, UGH syndrome, excessive fibrosis and synechiae, subluxation and dislocation of lens.

Now with the major improvements in microsurgical techniques, lens materials and lens design led to the increasing use of anterior and posterior chamber lenses since 1975 till date.

The anterior chamber IOLs have got the added advantages. (1) Implantation could be done after intra or extracapsular cataract extration. (2) Secondary implantation could be performed (3) Less chances of dislocation of lens (4) Easy to place without sophisticated equipments.

In the present study the ocular morbidity is noted in 30 cases of cataract extraction with anterior chamber IOL implantation within a follow period of 6-12 months.

Compllications during surgery

Hyphaema was seen in two cases (6.6 %) and it resolved in 4-5 days in present study. Dupont Guerry Walter J. Geeracts in 1962[36] also reported 7 % incidence of hyphaema out of 27 cases, which is similar to that in present study. Subhash P. Kadam (1987)[53] encountered 12.3 % cases of hyphaema out of 146 patients. S. Bharati et al. 1984-86[21] reported that hyphaema is usually not signifiant and stops spontaneously.

Incarceration of haptic into the corneoscleral wound was encountered in one case (3.3 %) in present study. It was reposited into the chamber at the time of operation and wound was resutured. Fechner & Alpar (1988) mentioned that it is common in learning phase.

Intraoperative shallowing of anterior chamber was encountered in two cases (6.6 %) in present study. It was due to bulging of iris and vitreous which settled down after the closure of wound and loosening of the lid and superior rectus sutures and the IOL implantation was done. We used visilon in all the cases and S. Tony Fernandez 1989[42] also stated that with the use of visilon these compllications were nil. Dupont & Walter J. Geeraets (1962)[36] reported (25.9%) 7 cases of intraoperative shallowing of anterior chamber out of 27 cases. Subhash P. Kadam 1987[53] reported positive vitreous pressure in 4 cases (2.7%) out of 146 cases. MC Nahata (1983)[61] reported vitreous bulge in 2 cases and bulging of iris lens diaphragm in 2 cases out of 20 cases.

Early postoperative complications

Striate keratitis was present in 8 cases (26.6 %) in present study. This incidence is similar to that of Daljit Singh (1983)[74] who reported 29.4 % incidence of striate Keratitis. O.P. Billore (1986)[23] found striate keratitis in 29.5 % with rigid anterior chamber IOLs and 19.82 % with flexible IOLs in a study group of 500 patients. NS Raju (1983)[69] reported 16.6. % incidence out of 12 patients. R.K. Mishra (1985) reported very high incidence (70 %) of mild to moderate keratitis and MC Nahata (1983)[61] also reported 75 % striate keratitis in a group of 20 cases.

Shallow anterior chamber was found in one case (3.3. %) and it resolved within 3-4 days with the treatment of pressure bandage and tab Diamox 1BD x 3 days and mydriatic

locally. This incidence is higher as compared to Daljit Singh et al. (1984-86)[75] who reported 1.6 % incidence of shallow anterior chamber.

Hyphaema was noticed in 3 cases (10 %) in present study and it was resovled within a week in all the three cases. Subhash P. Kadam 1987[53] encountered 12.3 % incidence of hyphaema.

Iridocyclitis was noticed in 6 (20 %) cases in our study. In most cases it resolved within 2-3 weeks with the treatment for iridocyclitis except in one case in which it persisted upto two months. MC Nahata (1983) also reported 20 % incidence of iridocyclitis whereas Daljit Singh et al. (1983)[74] reported lower incidence 11.5 % severe uveitis. Subhash P. Kadam (1987)[53] reported total 15.7 % incidence of mild to moderate uveitis. OP Billore et al. (1986)[23] repoorted 14.7 % uveitis with rigid anterior chamber IOL and 9.8 % with flexible IOL of anterior chamber. Whereas RK Mishra et al. (1985)[58b] reported 22 % mild, 63 % moderate and 11 % severe iridocyclitis which is quite high in comparison to present study.

Incarceration of haptic into the wound was noticed in one case (3.3 %) and it was treated by reopening the wound in O.T. and repositioning of haptic in the chamber.

Riding of pupillary margin over IOL was present in one case (3.3. %) in present study. It got corrected by itself in a period of six weeks. RK Mishra et al. (1985)[58b] reported 2 % incidence of riding of pupillary margin.

Precipitate deposition on IOL was encountered in 3 cases (10 %) in present study and all these cases had iridocyclitis. RK Mishra et al. (1985)[58b] reported 7 % and MC Nahata (1983)[61] reported 5 % incidence of precipitate deposition but Daljit Singh (1982)[76] reported only 2.3 % incidence.

Pigment deposition was seen in one case (3.3. %) in my present study. These deposits were completely absorbed within a period of 4 weeks without leaving any ill effect on vision. This incidence is quite low as compared to that of OP Billore (1986)[23] who reported 13.11 % incidence and RK Mishra (1985)[58b] reporeted 30 % incidence.

Corneal Oedema was encountered in one case (3.3 %) in my present study. It was very mild and subsided within a week. This incidence is quite low as compared to that of MC Nahata (1983)[61] who reported persistent corneal oedema in 3 (15 %) out of 20 eyes and OP Billore (1986)[23] reported corneal oedema in 7.9 % in rigid type anterioor chamber IOL and 16.72 % in flexible anterior chamber IOL.

Late Postoperative Complications

Persistent iritis was present in one case (3.3 %) in present study. It was associated with raised intraocular pressure. It subsided after treatment for iridocyclitis and raised intraocular tension in a period of 2 months. The incidence of persistent iridocyclitis is quite low in present study as compared to that of NS Raju (1983)[69] who reported 8.66 % cases of persistent uveitis.

Complaint of flashing of light was there in four cases (13.3%). It was due to optical properties of the IOLs

especially in those that have optic infront of iris permit an internal reflection of the light Alpar Fechner (1988)[11]. S. Tony Fernandez (1989)[42] reported 33 % incidence of disturbance in looking at light and shimmering of objects in 5 % which is higher than in the present study.

There were no cases of corneal endothelial decompensation in present study. J. Watts (1979-1983)[82] also didn't report any case of corneal endothelial decompensation.

Iris tuck was not seen in any case in present study which is comparable to similar reports by J. Watts (1979-1983)[82] and Daljit Singh (1980) who also didn't reported any case of iris tuck.

Visual achievements

In present study 6/6 vision was achieved in 2 cases (6.6 %), 6/9 in 14 cases (46.6 %) , 6/12 in 12 cases (40 %) and 6/18 in 2 cases (6.6 %) after spectacle correction i.e. 93.2 % cases achieved vision 6/12 or better. J. Walts also (1984) reported 6/12 or better vision in 92 cases and less than 6/12 in 8 % cases in a group of 181 cases. S. Bharati et al.[21] reported 6/6 by 36.70 %, 6/9 by 47.46 %, 6/12-6/18 by 12 %, 6/24-6/36 by 3 % and 4/60 by 0.63 %. Y.M. Paranjpe (1983)[64] reported 6/6 visual acuity achievement in 16 % and rest 84 % achieved 6/12 vision. These visual achievement are better than my present study. Whereas OP Billore (1986)[23] reported 6/12-6/6 visual acuity by 78 % and 6/36-6/18 by 15 % and 6/60 by 7 %, these results are lower than that in present study. S. Tony Fernandez (1986) reported visual achievements 6/6 to 6/12 by 70 %, 6/18 to 6/36 by 26.2 %. He

also mentioned that the cause of low vision were macular changes in 8 eyes, corneal opacity in 4 cases and no reason was found in 4 cases.

In my present study visual achievement 6/6 to 6/12 were in 93.2 % cases as these cases were clean cases i.e. without any pathology such as corneal changes or fundus pathology. These results are comparable to that of Rooper Hall (1979) who reported 94 % good visual results with a follow-up period of more than 2 years. J. Gibson (1980) reported visual acuity 6/6 to 6/12 in 84 %, 6/18 to 6/60 in 14 % cases and less than 6/60 in 2 % cases. Out of these 2 cases had developed corneal pathology postoperatively and in his series the postoperative astigmatism on an average was 2.84 D (there were 2 cases with + 6D, 3 cases of 5.5 D out of 100 cases).

In present study I encountered no corneal or fundus pathology postoperatively also and astigmatism was not more than 2 Dioptre in any case. Percival and Yousef (1976)[67] also reported average postoperative astigmatism of less than 1.5 D in a series of 25 cases.

In the present study good binocular vision was achieved in 21 cases (70 %) and rest 9 patients could not achieve binocularity as they were having mature cataract in 2 cases and advanced immature cataract in 7 cases in the other eye. Whereas RK Mishra et al. (1987)[58] reported 40 % very good binocularity, 39 % good binocular vision and 9 % satisfactory binocular vision.

CONCLUSION

CONCLUSION

The present study has been carried out to detect ocular morbidity in cases of anterior chamber intraocular implantation with cataract extraction. The following are my conclusions drawn out of the present study.

1. Good visual acuity achievement and good bninocular vision alongwith better field of vision and no enlargement of image are certain advantages of IOL.

2. As a result of good visual achievement patients were able to resume their duties quite early.

3. Corneal endothelial decompensation and dystrophy, persistent iritis, iris atrophy, UGH syndrome are the common ocular morbidity reported to be associated with anterior chamber IOLs. In the present study these complications were not observed.

4. Incidence of striate keratitis, mild hyphaema, iridocyclitis were there but all these complications resolved with the medical treatment.

5. Over-riding of pupillary margin over IOL & distortion of pupil are relatively mild problems without any ill effect on eye or on visual results.

6. Post-operative astigmatism was not more than 2D in any of the cases and visual achievement was upto 6/12 in 93.2 % cases. So I conclude that if clean cases are selected the

final visual achievements are good and astigmatism is not much if the section is properly made and sutured.

7. I conclude that cataract extraction with anterior chamber intraocular implant is a quite safe procedure in expert hands and in properly selected cases gives good results. Since this process does not require any sophisticated equipments, it can be performed in small hospitals even.

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APPENDIX

PROFORMA FOR EXAMINATION

CASE NO.

1. Name of Investigator : Dr UMESH KUMAR AHERWAR
2. Surgeon I/C
3. Place : Medical College Hospital Jhansi, Department of Ophthalmology.

Date :

DETAILS OF PATIENT

1. Name _____
2. Age/Sex _____ Wd/Bed _____
3. Address _____
4. Occupation _____
5. Socio Economic Status _____
6. In habit of taking any intoxicant _____

A. PRESENTING SYMPTOMS:

1.

2.

3.

B. A BRIEF HISTORY OF PRESENT ILLNESS:

Past History

H/O Diabetes

Hypertension

Any other

Family History

Examinations:

General Examination

CVS

Respiratory System

CNS

Abdomen

Local Examination

	Rt	Lt
1. Facial Symmetry		
2. Eye brows		
3. Eye lashes		
4. Eye lids		
5. Conjuctiva - Bulbar		
- Limbal		
- Palpabral		
- Intermarginal strip		
6. Cornea - Size		
- Shape		
- Surface		
- Curvature		
- Lustre		
- Transparency		
- Sensitivity		
7. Anterior Chamber		
(i) Depth - Normal/Shallow/Deep		
(ii) Contents - Colour		
- Nature		
- Flare, if any		
8. Iris - Colour		
- Surface		
- Pattern		
- Atrophy, if any		
9. Pupil - Size		
- Shape		
- Colour		
- Reaction to light		
Direct		
Consensual		

10. Lens - Position

- Transparency

- Any othr finding

11. Visual acuity Rt Lt

12. Digital tension

13. Tonometry Shiotz :

Applanation:

14. Fundoscopy :

15. Gonioscopy :

16. Perimetry :

17. S/L Examination :

18. Diagnosis :

Investigation:

(i) Urine examination

(ii) Blood routine examination

(iii) Blood sugar

Operative History

1. Date of operation :
2. Type of anaesthesia :
3. Type of surgery :
4. Use of visilon :
5. Type of lens implantation :

Power of lens :

6. Complications

Type	Rupture of lens	Vitreous Prolapse/loss	Hyphema	Iris Injury	Any other

Post operative follow up Rt/Lt Eye

Date of Exam/ period	Conjuctiva	Condition of wound	Cornea	A/C	Position of lens	Iris	Pupil	Other

SUMMARY

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After the extraction of lens in cataract surgery aphakia develops, which is usually corrected by aphakic glasses/spectacles. But this method of aphakic correction may cause many optical problems to the patients.

Implantation of Intraocular lenses are almost free from these optical problems, they give full field of vision and spherical aberrations, are small. Beside this IOL implantation have been reported to cause many complications. There are many types of IOL implants like anterior chamber IOL, Iris supported IOL implants and posterior chamber IOL implants.

The present study has been carried out" to detect ocular morbidity in anterior chamber lens implantation after cataract extraction in thirty patients.

These patients were admitted from OPD of Eye deptt. MLB Medical College, Jhansi for anterior chamber IOL implantation after lens extraction and cases were followed up for 6-12 months after discharge from the hospital. Patient having diabetes, hypertension, arthritis and thyroid disease were not selected for IOL implantation. Cases having any ocular inflammation, glaucoma, corneal disease or single eyed patient were not selected for IOL implantation.

Flexible open loop angle fixated anterior chamber lenses of J-loop shape (Shah & Shah). were used in this study.

The following complication were detected in this study.

Intraoperative hyphaema in 6.6 %, incarceration of haptic in to the wound 3.3 % & intraoperative shallowing of anterior chamber in 6.6 % cases. All these complications were resolved with routine treatment without having any ill effect.

Early post-operative complication

Striate Keratitis was encountered in 26.6 % Corneal Oedema in 3.3 %. It resolved within a period of 4.6 period was taken for it to resolve completely. Corneal oedema was very mild and subsided within a week.

Shallow anterior chamber was found in 3.3 % and it was cured within 3-4 days with treatment with pressure bandage, tab Diamox & Mydriatic.

Hyphaema was encountered in 10 % and it also disappeared within a week in all the cases.

Iridocyclitis was present in 20 % cases and resolved within 2-3 weeks except in one case which persisted for two months. This case of persistent iridocyclitis also responded well to the treatment of iridocyclitis with good visual results.

In one case (3.3 %) incarceration of haptic into wound was noticed in early post-operative which was reposited

into the anterior chamber after reopening of the chamber in OT & resuturing of the section was done.

Raised intraocular tension was present in a case (3.3 %) and it was associated with iritis and retention of visilon in the anterior chamber. This raised tension was relieved after treatment.

Riding of pupillary margin over IOL was present in 3.3 % with tilt of lens. This problem didn't have any problem for the patient and got corrected by itself.

Precipitate deposition IOL were present in 10 % & were associated with iridocyclitis & cleared in two weeks time.

Pigmentary deposits were seen in 3.3 % and distortion of pupil was absorbed in 10 % cases but these complications didn't impart any ill effect on vision. Pigmentary deposits were observed within a period of 4 weeks.

Late post-operative complications

Late complications like endothelial corneal dystrophy cystoid macular oedema, ratinal detachment, iris atrophy, uveitis glaucoma hyphaema syndrome and adhesions between iris and IOL were encountered in present study.

Persistent iritis was present in 3.3 % which also resolved after 2 months with the treatment.

Flashing of light was there in 13.3 % cases.

Visual acuity results after spectacle correction were as follows: 6/6 in 6.6 %, 6/9 in 46.6 %, 6/12 in 40 % and 6/18 in 6.6 % cases. Good binocular vision was obtained by 93.3 % cases.

The following are my conclusions of this study:

1. Good visual acuity achievement and good bninocular vision alongwith better field of vision and no enlargement of image are certain advantages of IOL.

2. As a result of good visual achievement patients were able to resume their duties quite early.

3. Corneal endothelial decompensation and dystrophy, persistent iritis, iris atrophy, UGH syndrome are the common ocular morbidity reported to be associated with anterior chamber IOLs. In the present study these complications were not observed.

4. Incidence of striate keratitis, mild hyphaema, iridocyclitis were there but all these complications resolved with the medical treatment.

5. Over-riding of pupillary margin over IOL & distortion of pupil are relatively mild problems without any ill effect on eye or on visual results.

6. Post-operative astigmatism was not more than 2D in any of the cases and visual achievement was upto 6/12 in 93.2 % cases. So I conclude that if clean cases are selected the

final visual achievements are good and astigmatism is not much if the section is properly made and sutured.

7. I conclude that cataract extraction with anterior chamber intraocular implant is a quite safe procedure in expert hands and in properly selected cases gives good results. Since this process does not require any sophisticated equipments, it can be performed in small hospitals even.